

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS**

PRESIDENT AND FELLOWS OF
HARVARD COLLEGE,

Plaintiff,

v.

UNITED STATES DEPARTMENT OF
HEALTH AND HUMAN SERVICES, et al.,

Defendants.

Case No. 1:25-cv-11048-ADB

DECLARATION OF JOHN SHAW

I, John Shaw, declare as follows:

1. I am the Vice Provost for Research at Harvard University (“Harvard” or “the University”). I have held that position since January 1, 2022. I am also the Harry C. Dudley Professor in the Faculty of Arts & Sciences, and a Professor of Environmental Science and Engineering in the John A. Paulson School of Engineering & Applied Sciences. I make this declaration in support of Harvard’s Motion for Summary Judgment.

2. As Vice Provost for Research, I have personal knowledge of the contents of this declaration and could testify thereto.

Federal Research Grants Fund Essential Research at Harvard

3. Harvard University is a non-profit institution which provides undergraduate and graduate instruction to more than 24,000 enrolled students annually across 13 schools and is the oldest institution of higher learning in the United States and one of the world’s leading research universities.

4. Harvard consistently ranks among the top universities in the United States for research expenditures and scientific output. For 75 years, Harvard’s research efforts have been

supported by the federal Government. Federal research grants support Harvard's ability to recruit and retain faculty, maintain labs, and support graduate students and other researchers.

5. In fiscal year 2024, Harvard received a total of \$684 million in sponsored funding from the federal Government.

6. As of April 14, 2025, Harvard was a recipient of active grants from the following agencies: the National Endowment of the Arts ("NEA"); the National Institutes of Health ("NIH"); other subagencies of the Department of Health and Human Services ("HHS"); the National Science Foundation ("NSF"); the Office of Personnel Management ("OPM"); the Department of Justice ("DOJ"); the Department of Agriculture ("USDA"); the Department of Education ("Education"); the Department of Energy ("Energy"); the Department of Defense ("DoD"); and the National Aeronautics and Space Administration ("NASA"); the Department of Agriculture ("USDA"); and the Department of Housing and Urban Development ("HUD"). Federally funded research at Harvard has made millions of Americans healthier and safer.

7. The federal research funding Harvard receives supports, for example, critical and cutting-edge medical research across the University, including at the Medical School, School of Public Health, and affiliated teaching hospitals such as Massachusetts General Hospital and Brigham and Women's Hospital. For example:

- a. ***Cancer Research:*** Harvard's cancer research includes identifying mechanisms that drive disease development at all stages including tumor metastasis; developing new therapeutic approaches with the goal of preventing, targeting and suppressing cancer at every stage; mapping the metabolic signaling pathways that drive the association of cancer with other diseases, to restore proper cellular function and enhance prevention; and

developing a new machine learning method to model the behavior of all 25,000 human genes as they respond to high-intensity treatments like chemotherapy, which the National Cancer Institute cited as an advancement in basic cancer research that will lay the groundwork for future clinical breakthroughs.

- b. ***Infectious Diseases Research:*** Harvard researchers study infectious diseases to better understand and address the global threat of multidrug-resistant infections; develop new tools for global pandemic prevention; discover new therapeutic antibodies and small molecules to treat or cure viral diseases; and develop enhanced approaches to monitor disease outbreaks and to predict patterns of spread.
- c. ***Microbiome Research:*** Harvard's microbiome research includes developing new frontiers in precision medicine that can help individuals reduce their risk of cancer and other diseases by better understanding and leveraging our bodies' relationship with the multitude of bacteria and other microorganisms that contribute to human health and disease.
- d. ***Toxin Reduction Research:*** Harvard's toxin reduction research includes studying the harm from microplastics on fertility, and developing life-saving guidance for those exposed to high levels of toxins, including firefighters, individuals working in environments with high exposure potentials (e.g., members of the military, miners, and chemical factory workers), and children in rural communities.

- e. **Neurological Research:** Harvard's neurological research includes identifying numerous modifiable risk factors for Parkinson's disease, multiple sclerosis, and other neurological diseases including conditions that are generally age-related, such as Alzheimer's (and other forms of dementia) and stroke, which creates the potential to significantly cut disease incidence and reduce healthcare costs. Other research involves efforts to better understand the role of infections in seeding neurodegenerative disorders, with important implications for prevention, diagnosis, and treatment. And other research involves studying the long-term neurologic effects of radiation and chemotherapy-based treatment on young children who survived cancer and identifying treatments to improve outcomes that also reduce the impact of therapy-related collateral damage, which is also relevant to adult cancer survivors.
- f. **Biotechnology:** Harvard's biotechnology research includes studying how spaceflight, including space-related radiation, affects blood cell formation in astronauts on the upcoming Space Station and ARTEMIS missions. That research is also developing a new class of anesthetics that could lead to breakthroughs in the care of wounded servicemembers in the field that would obviate the need for trained anesthesiologists or hospitalization. And it is advancing organ chip technology—small devices the size of a USB drive that mimic the functions and physiological responses of living human organs—to further understanding of, among other things, illnesses and injuries that result from high doses of radiation.

- g. ***Technological Innovation:*** Additional research at Harvard supports innovations in quantum computing, artificial intelligence and machine learning, nanomaterials, microchip design, biomechanics, chemical engineering, next-generation batteries, computer science, “smart” living environments for the elderly, and more.
- h. ***Military Advancements and National Security:*** Harvard also dedicates research to reducing the short- and long-term consequences of traumatic battlefield related injuries; developing soft robotics for enhancing battlefield performance; creating compact and rapidly deployable (foldable) bridges and other structures for military use; developing radiation countermeasures and limb regeneration; and developing hack-resistant computer networks, rapid infectious agent diagnostics, and ways to combat antibiotic resistance.

8. Scientific, medical, technological, and other research and advances at Harvard drive our national economy, support employment not only in Massachusetts but also across the country, and improve lives. In addition, federal research grants support Harvard research programs that teach and train future scientists.

9. The University currently employs approximately 1,800 research faculty and staff whose positions are partially or wholly supported by federal research grants and contracts. Additionally, approximately 730 graduate students and 790 postdoctoral researchers receive stipends, tuition support, or salary from federally funded research projects.

The Federal Government is Reviewing and Terminating Harvard’s Research Grants

10. On April 14, 2025, immediately after the Government’s April 14, 2025 announcement that it was freezing \$2.2 billion in multi-year grants and \$60M in multi-year

contracts to Harvard, Harvard administrators and faculty began receiving stop work orders and notices of termination for ongoing federal research funding that had already been awarded. For example:

11. On May 6, 2025, NIH sent a notice of termination to Harvard. HSHHarv_00000473-502. The notice concerns numerous grants.

- a. “Pediatric HIV/AIDS cohort study (PHACS) 2020,” with grant award ID P01HD103133, was among the grants terminated. That grant awarded \$88,304,328 to Harvard to research pediatric HIV/AIDS, specifically studying uninfected infants and children with perinatal HIV exposure and young adults with perinatal HIV to understand the short- and long-term outcomes of HIV infection and antiretroviral medications.
- b. “Exploiting membrane targets to overcome antibiotic resistance,” with grant award ID U19AI158028, was among the grants terminated. That grant awarded \$10,124,427 to Harvard to investigate strategies to combat antibiotic-resistant infections.
- c. “Metals and metal mixtures: cognitive aging, remediation and exposure sources (MEMCARE),” with grant award ID P42ES030990, was among the grants terminated. That grant awarded \$8,339,987 to Harvard to “understand and mitigate effects of exposure to metals and metal mixtures on late-life cognitive health.”
- d. “Tracking the evolution of breast cancer through single cell analyses of premalignant breast tissues from women at high risk for cancer development,” with grant award ID R35CA242428, was among the grants

terminated. That grant awarded \$7,089,082 to Harvard and aimed to find and describe early changes in breast tissue in women that may be at a higher risk of breast cancer in order to “develop strategies to detect and prevent the development of breast cancer.”

- e. “Characterizing pubertal and age mechanisms of neurodevelopment and association with rising internalizing symptoms,” with grant award ID R01MH129493, was among the grants terminated. That grant awarded \$3,376,144 to Harvard to study human brain development from childhood into early adulthood and better understand youth mental health.
- f. “Event-related neuroimaging of human memory formation,” with grant award ID R01MH060941, was among the grants terminated. That grant awarded \$2,112,500 to Harvard and supported research into “the nature and functions of episodic memory.”
- g. “Evolutionary Tradeoffs in Antibiotic Resistance,” with grant award ID R35GM156320, was among the grants terminated. That grant awarded \$2,417,350 to Harvard and aimed to advance our existing model of resistance to antibiotics. That grant was awarded to Harvard after January 20, 2025 (*i.e.*, *during* this Administration) before it was abruptly terminated.

12. Also on May 12, 2025, NSF sent a notice of termination to Harvard. NSF_Harvard000039-44. The notice concerns numerous grants.

- a. “CAREER: Linking systemic stem cell activation to vertebrate limb regeneration,” with grant award ID 2145925, was among the grants terminated. That grant awarded \$1,012,400 to Harvard and supported

research about how injury signals are transmitted system-wide in animals and how these processes impact local tissue regeneration, including possible limb regrowth following amputation.

- b. “Untangling Inter-Area Communication in the Brain Using Multi-Region Neural Networks,” with grant award ID 2427124, was among the grants terminated. That grant awarded \$351,588 to Harvard and supported research to understand how different regions of the brain work together in a coordinated manner to perform complex tasks such as decision making.

13. Also on May 12, 2025, DoD sent a notice of termination to Harvard. DoDHarv_00000039-46. The notice concerns numerous awards.

- a. MUPPETS: Miniaturized Universal Platform for Preservation of Environmental Test Samples, with grant award ID HR00112420367, was among the awards. That cooperative agreement awarded \$11,949,925 to Harvard to increase DoD’s awareness of emerging biological threats.
- b. Optimizing Individualized Colorectal Cancer Treatment and Prognostic Prediction via Causal Machine Learning, with grant award ID HT94252310523, was among the grants terminated. That grant awarded \$1,174,848 to Harvard and supported research about “optimizing individualized colorectal cancer treatment and prognostic prediction via casual machine learning.”

14. Also on May 12, 2025, Energy sent a notice of termination to Harvard. ENERGY AR3932-33. The notice concerns numerous grants.

- a. “Particle Physics and Cosmology Research,” with grant award ID DE-SC0007881, was among the grants terminated. That grant awarded \$7,995,000 to Harvard to study data from the ATLAS experiment at the Large Hadron Collider (LHC) to better understand particle, sub-atomic, supersymmetry, Dark Energy, and other areas of physics.
- b. “Research into Theoretical High Energy Physics,” with grant award ID DE-SC0007870, was among the grants terminated. That grant awarded \$3,395,000 to Harvard to develop “a multi-pronged effort to better understand the fundamental laws of nature as well as to apply the insights gained so far to other problems in physics and mathematics” including quantum gravity, string theory, and black holes.

15. After April 14, 2025, Harvard received seven stop work orders associated with awards totaling approximately \$76,000,000. After May 6, 2025, Harvard received over 950 federal award terminations totaling approximately \$2,400,000,000.

The Terminations of Harvard’s Research Grants Will Severely Impact Harvard University and the Harvard Community

16. For decades, Harvard has relied on federal funding to support its research efforts. Until recently, it was able to rely on the well-established process with the federal Government to inform its budgeting and planning. Absent replacement funding, these terminations would diminish operating budgets and would destroy ongoing research. The terminations would interrupt or halt data collection and interrupt or halt long-term studies. Now or over time, they would force labs to shut down and dismantle equipment. The terminations will also damage Harvard’s ability to procure and maintain the sophisticated equipment that advanced research requires. Faculty would lose funding for their work. Graduate students would lose stipends and leave their programs.

Postdoctoral researchers would be laid off. Harvard would lose key staff with specialized skills. Collaborations with other institutions would collapse. The loss of trust would drive away future academic and research partners. The training pipeline for future scientists would be harmed. Harvard's competitive standing of its research programs would fall, and competitor institutions and actors domestically and internationally would gain an advantage. The harm would be severe and long-lasting. Money cannot repair the lost time, talent, and opportunity.

17. Harvard's operating budgets rely on an estimate of funding to plan for annual staffing needs and equipment purchases. Harvard also has long-term obligations, with respect to admitted PhD students, for example, and the infrastructure support and facility maintenance required to support ongoing research.

18. Many of the fixed cost investments made to support the research would be lost. Many of these projects span years or decades and depend on consistent funding. Harvard has already invested heavily in staff, equipment, and infrastructure to support this work. Researchers have spent years designing studies, recruiting participants, and building data sets. The loss of continuity, such as gaps in collection of time-series information, may make data inadequate or unusable for the intended purpose. For longitudinal health studies, missed check-ins may make it impossible to properly evaluate changes from baseline. For environmental research, lost seasons of data undermine models used to assess, forecast, and mitigate environmental impacts. For social science, interrupted surveys undermine trust with participants. Researchers would lose years of work. These losses would set back entire fields, slow discovery, and waste public investment. The resulting slowing or halting of approximately 950 ongoing research projects would also do immediate damage to the research itself. It would cause: (1) termination of longitudinal studies that cannot be restarted once interrupted; (2) loss of unique experimental data that cannot be

reproduced; (3) abandonment of partially completed research that represents years of scientific investment; and (4) disruption of collaborative research programs. New investments would be needed to resume the work. This would create cost inefficiency and delays.

19. Lab shutdowns would dismantle physical infrastructure and sever research workflows. Sensitive equipment would sit idle and degrade. Perishable samples would spoil. Live specimens would be euthanized. Custom reagents, cultures, and prototypes would be lost. Specialized tools, often calibrated for unique projects, would fall out of use. Restarting a lab often requires months of setup, testing, and recalibration. Many labs rely on continuous processes, so interruptions would render years of work useless. Faculty who use these labs would see stalled publication pipelines. Research teams would scatter as technicians, postdoctoral researchers, and students seek other work. Expertise built over decades would dissipate. Harvard has invested substantial resources in specialized research facilities, equipment, and personnel to support federally funded research. Once dismantled, this research infrastructure cannot be readily reconstructed. The University maintains more than 90 specialized research facilities and core laboratories that depend on federal funding for operational support. These facilities support not only Harvard's research but may also serve regional and national research communities. And these economic losses would ripple outward. Vendors, service providers, and contractors tied to lab operations would lose income. At the national level, the shutdown of advanced labs would weaken critical research capacity. This would leave gaps in public health, defense, and technology.

20. Lost faculty funding would force professors to halt their research and abandon active projects. Faculty would be unable to pay research staff, maintain lab operations, or purchase materials. Many would be unable to continue mentoring students. And junior faculty would encounter particularly harmful setbacks. They would lose their first major projects, fall behind

peers, and risk having to leave their academic research career. Senior faculty would see their labs dismantled and their teams dispersed. Faculty with joint appointments at research hospitals or government agencies could lose those affiliations. The loss of funding would also reduce faculty teaching capacity. Course offerings tied to funded research would disappear. Independent study, thesis advising, and lab instruction would shrink. Students would lose mentors and career paths.

21. Graduate and postdoctoral researchers would face immediate loss of income, stability, and purpose. Many rely on federal grants for stipends, salaries, and tuition support. That funding helps them pay rent, afford health insurance, and/or remain enrolled. Without this funding, many would be forced to leave their programs, and some would leave academia altogether. Those near completion would abandon dissertations or postdoctoral projects with no clear way to finish. Years of specialized training would be wasted. In other words, the University would lose not only the opportunity to train the next generation of scientists but also a vital workforce, because graduate students and postdocs drive much of the hands-on research at Harvard. They run experiments, analyze data, write papers, and train junior students. Their departure would cripple lab operations. Departments would see fewer teaching assistants, fewer publications, and fewer graduates. The long-term loss of early-career scientists would damage the national research pipeline. These researchers become future faculty, inventors, clinicians, and educators. Their work leads to patents, startups, and public goods. Their absence would create a gap in innovation and leadership.

22. Staffing reductions would immediately slow down research projects, create potential health and safety risks, and even jeopardize national security interests related to these projects. Administrative staff ensure compliance with a significant number of regulatory mandates from federal agencies, including: protecting human and animal subjects involved in research;

ensuring research integrity; properly managing and disposing of chemical and biological agents used in research; preventing financial conflicts of interest; managing awards; preventing intellectual property, technologies, or national security expertise from being inappropriately accessed by foreign adversaries; and providing the high level of cybersecurity, data storage, and computing environments necessary for regulated data.

23. Lost collaborations with other institutions, damaged institutional trust, and diminished institutional reputation would isolate the University from the national research community. Partner institutions would have to withdraw from shared grants, multi-site studies, and consortium agreements. Private foundations and industry partners would hesitate to fund joint proposals. Other universities would steer clear of co-authorships and subawards. Faculty would lose access to shared data, equipment, and field sites. Long-standing relationships with government labs, hospitals, and research networks would end. These ties often take years to build and cannot be quickly rebuilt. Damaged trust would also affect peer review. Faculty from the University would be less likely to receive favorable evaluations for grants, fellowships, or journal submissions. Loss of reputation would drive away top faculty, students, and postdoctoral candidates. Recruitment efforts would suffer.

24. A diminished training pipeline for future researchers would weaken Harvard's core mission. It would reduce the number of students entering research programs, which means that fewer undergraduates would have access to labs, mentors, or hands-on learning. Graduate admissions would shrink as funding disappears. Departments would offer fewer fellowships and assistantships, and postdoctoral positions would vanish. Harvard would produce fewer PhDs and fewer faculty-ready candidates. Programs that prepare students for research careers in medicine, engineering, and public health would stall. Students who stay would receive less training, less

support, and fewer opportunities to publish or present their research. They would enter the workforce with weaker resumes and fewer skills.

25. Slowing down or halting research by Harvard will make it possible for competitor nations to surpass the United States in some areas in which we now have research primacy. These slowdowns may also harm the Boston area and the Commonwealth of Massachusetts, as Harvard is one of the state's largest employers. In 2023, Harvard directly employed over 18,700 Massachusetts residents. Harvard frequently collaborates with state and local partners on regional initiatives, and it fuels spending in the local economy, including by driving discoveries that launch new initiatives, attract private investment, and make positive changes in the surrounding communities.

26. For example, a DoD official responded to the internal directive to terminate the grant MUPPETS: Miniaturized Universal Platform for Preservation of Environmental Test Samples (grant award ID HR00112420367) by writing that the grant "shouldn't be covered by this directive" and asking that the Government "allow performance to continue." [DoDHarv_00000047]. The official explained that "Harvard is currently the top performing team on the . . . program"; "[i]nadequate knowledge of the biological threat landscape poses grave and immediate harm to national security"; and Harvard is "a critical integrator of multiple technologies that enable this effort and could not be readily reproduced." [DoDHarv_00000047].

27. All of this damage would severely impact Harvard's capacity to contribute to scientific progress and innovation, in part because research is an iterative process that builds on itself and depends on continuous, uninterrupted work. The disruption in ongoing research would harm public health. Harvard researchers are currently engaged in federally funded projects directly addressing critical public health challenges, including cancer treatments and prevention, infectious

diseases, and Parkinson's. In light of the terminations, those projects are in jeopardy, and potentially life-changing and life-saving scientific and medical discoveries will be delayed or blocked altogether.

28. In short, absent an ability to secure equivalent replacement funding, Harvard's standing as a premier research institution would suffer immediate and lasting damage from the termination of federal funding, compromising its ability to: (1) recruit and retain top research faculty; (2) attract exceptional graduate students and postdoctoral researchers; (3) secure future research funding from federal agencies and other sources; and (4) maintain collaborative relationships with other research institutions and partners.

29. Harvard cannot secure equivalent replacement funding from any other public or private institution.

30. Harvard also cannot cover the funding gap itself. Harvard has a significant endowment, but it is neither feasible nor sustainable for Harvard to use endowment funds or other revenue sources to offset the significant gap caused by the termination of federal funding for several reasons, including:

- a. The majority of the University's endowment—around 70%—is restricted to specific donor-designated purposes, such as scholarships, faculty chairs in designated fields of study, and specific academic programs. Harvard is not legally permitted to divert those funds to cover research infrastructure costs.
- b. As a non-profit institution, Harvard reinvests nearly all of its revenue, including over \$2.5 billion distributed from its endowment this year, into mission-critical activities, leaving little margin to absorb unexpected funding gaps. In other words, unlike for-profit organizations, the University

does not generate significant surpluses that could be redirected without compromising core academic priorities such as educational programs and financial aid support for students.

- c. After sponsored research support and endowment revenue, Harvard's next largest source of revenue is student tuition. But the University cannot simply increase tuition rates to cover losses in federal funding without severely impacting the opportunities for lower income families through investments in financial aid.

31. Even if Harvard could draw on its endowment to replace the terminated funding, that draw down itself will harm the University. The endowment is not a general reserve. It is made up of thousands of individual funds, each tied to a specific purpose. Many funds, over 70%, are restricted regarding their use, that is, legally bound to support scholarships, faculty chairs, or particular academic programs. And over 80% of Harvard's endowed funds are restricted by law regarding the amount that can be drawn each year. Diverting those funds would breach donor intent and risk litigation. Even the remaining limited unrestricted funds are already allocated to support the primary educational and research mission of the University, as well as to sustain long-term financial health. Harvard relies on annual endowment payouts to fund core functions—teaching, student aid, academic services, as well as research. In fiscal year 2024, the annual endowment payout was nearly \$2.4 billion, yet Harvard still reported an \$18 million operating loss on its unrestricted funds, suggesting that annual draw was insufficient to cover, along with tuition revenue and federal sponsored funding, the costs of educating over 24,000 students and conducting research. A sudden, increased drawdown would reduce future annual payouts for years to come. This would force cuts to faculty hiring, course offerings, and financial aid. Students would lose

access to scholarships and need-based grants. Program quality would fall. Faculty and staff would face salary freezes, hiring delays, and job insecurity. Harvard would become less competitive across every academic area. The damage would compound over time. Replacing lost federal research funding through increased draws from unrestricted endowment funds would cause severe and long-lasting disruption to Harvard's budget, its mission, and its ability to serve students. The loss would spread far beyond the affected funding. It would hurt every part of the institution.

* * *

I declare under penalty of perjury, pursuant to 28 U.S.C. § 1746, that the foregoing is true and correct to the best of my knowledge.

Executed on June 2, 2025, in Cambridge, Massachusetts.

/s/ John H. Shaw

John H. Shaw

Harvard University

Vice Provost for Research

Harry C. Dudley Professor of Structural &
Economic Geology, FAS

Professor of Environmental Science and
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